

BDMAI BULLETIN



From the Desk of President

Dear Friends,

I am pleased to share a few thoughts with our members on the important developments in our industry and the activities of our Association.

Our Annual General Meeting, held on 26th September 2026, was an important occasion for the BDMAI fraternity to come together, exchange views and discuss issues of significance to the bulk drug industry. We were privileged to have Dr. Rajeev Singh Raghuvanshi, Drugs Controller General of India (DCGI), as the Chief Guest, and Dr. R. Chandrasekhar, Joint Drugs Controller General of India, as the Guest of Honour. The regulatory update shared by the DCGI and the emphasis placed on quality as the foundation of a sustainable pharmaceutical industry were particularly valuable to our members.

I sincerely thank all our members for their active participation and support in making the AGM a meaningful and successful event.

India's bulk drug exports continue to show encouraging momentum, registering growth of around 8% during April-August 2026 over same period of 2025. This is a positive indication of the resilience and competitiveness of Indian manufacturers. Our recent interaction with the US officials indicate that they are increasingly focused on securing the supply of APIs & KSMs from India and at the same time pushing for APIs on shoring in US.

However, rebuilding supply chains and establishing alternative manufacturing capacities is a complex process. Given the existing concentration of manufacturing capabilities, established supply chains, cost structures and the stringent regulatory requirements involved, it is widely acknowledged that achieving substantial self-reliance will take several years.

Against this backdrop, India is well positioned to strengthen its role as a reliable and trusted supplier of APIs to global markets. I believe that the next three to four years could offer considerable opportunities for Indian API manufacturers to increase their global market share.

As an Association, BDMAI will continue to represent the interests of the industry before the Government, facilitate constructive engagement with regulatory authorities and promote initiatives that enhance the competitiveness of Indian bulk drug manufacturers.

With warm regards,

Ch. A. P. Rameswara Rao
National President

In this Bulletin
you can expect

**Global Pharma
Market
Intelligence**

**Analysis of Bulk
Drugs Exports &
Imports (April-Aug)**

**Association
Activities &
Important Trade
Notifications**

Technical Article

Major New Drug Approvals and Developments

US FDA

- **Isembyld – apitegromab** FDA approved Isembyld (apitegromab), the first therapy specifically targeting muscle loss in spinal muscular atrophy (SMA). It is approved for adults and paediatric patients aged two years and above receiving an SMN2-targeted treatment. The drug represents an important development in therapies targeting muscle function rather than directly correcting the underlying genetic defect (11th Sep)
- **Joenja – leniolisib** FDA approved Joenja (leniolisib) as the first treatment for children aged 4–11 years with activated PI3K-delta syndrome (APDS), a rare genetic immune disorder. (11th Sep 2026)
- **Aqneursa – levacetylleucine** FDA approved Aqneursa (levacetylleucine) for ataxia in patients with ataxia-telangiectasia, another rare genetic disorder. (18th Sep)
- **Onswik – once-weekly insulin** - FDA approved Onswik (insulin efsitora alfa-gobe) as a once-weekly insulin for adults with type 2 diabetes. The approval is strategically important because long-acting and once-weekly insulin formulations could significantly simplify diabetes treatment and improve patient adherence (23rd Sep)
- **Lyrfigtu – lirafugratinib** FDA approved Lyrfigtu (lirafugratinib) x for previously treated, unresectable or metastatic cholangiocarcinoma carrying FGFR2 gene fusions or rearrangements. This is another example of increasingly biomarker-driven oncology, where treatment selection is based on molecular characteristics of the tumour. (23rd Sep)
- **Gazyva – obinutuzumab** - FDA approved Gazyva (obinutuzumab) for patients aged two years and older with idiopathic nephrotic syndrome (25th Sep)
- **Atebrioz – zilurgisertib** FDA approved Atebrioz (zilurgisertib), the third treatment for fibrodysplasia ossificans progressiva (FOP), a rare disorder involving abnormal bone formation – 25th Sep
- **Camzyos – mavacamten** - FDA approved Camzyos (mavacamten) to improve functional capacity and symptoms in children with a rare inherited heart condition (30th Sep)

The FDA's 2026 novel-drug list shows that by late September it had recorded 44 novel-drug approvals during 2026, demonstrating continued strong innovation activity in the US market.

Europe – EMA - The CHMP recommended 12 new medicines for approval, including:

- Frehemgo (denecimig) – haemophilia A
- Gevalka (ensartinib) – ALK-positive advanced non-small-cell lung cancer
- Klygefa (gefurulimab) – generalised myasthenia gravis
- Lifyorli (relacorilant) – platinum-resistant ovarian/fallopian tube/peritoneal cancer
- Povofortay (povorcitinib) – moderate-to-severe hidradenitis suppurativa
- Sepalna (senaparib) – maintenance therapy for advanced ovarian cancer
- VaxRabeo – rabies vaccine

The September CHMP meeting also produced 12 positive opinions on extensions of therapeutic indications.

UK MHRA

- The UK MHRA approved lurbinectedin (Zepzelca) for adults with extensive-stage small-cell lung cancer, in combination with atezolizumab as maintenance treatment. Lurbinectedin is a DNA-binding oncology drug that interferes with tumour-cell growth and also affects the tumour-supporting immune environment (23rd Sep) The UK continues to pursue greater regulatory cooperation and convergence with other major agencies.

CDSCO & Indian Pharma industry developments:

- **OERIS – extended-release ondansetron injection** Shilpa Medicare received CDSCO approval for OERIS (ondansetron extended-release injection). The product is reported as the world's first extended-release injectable ondansetron formulation, designed to provide antiemetic protection for up to 120 hours from a single administration. This represents an important formulation innovation and illustrates opportunities for Indian companies in differentiated formulations rather than conventional generics.
- **Nivorz – nivolumab biosimilar** Dr. Reddy's Laboratories launched NIVORZ, a biosimilar of nivolumab, in India following DCGI approval covering 12 cancer indications. The development highlights India's growing capabilities in biosimilar and immuno-oncology manufacturing.
- **CDSCO Investigational New Drug activity** - CDSCO published recommendations of its Subject Expert Committee on Investigational New Drugs for meetings held on 9 September and 16 September 2026, indicating continued activity in India's innovative drug development pipeline.
- **PRIP – ₹1,600 crore support for pharma innovation** - The Department of Pharmaceuticals announced approval of approximately ₹1,600 crore financial assistance for 41 projects under the first round of the Promotion of Research and Innovation in Pharma MedTech Sector (PRIP). These projects cover Novel drug

discovery, Clinical development, Advanced pharmaceutical technologies and Medical technologies. The projects are expected to catalyse an additional ₹3,020 crore private investment, taking aggregate investment associated with the approved projects to approximately ₹4,620 crore.

- WHO Prequalification announced on 16 September the prequalification of Bedaquiline (fumarate) API manufactured by Arene Life Sciences Pvt. Ltd., India. Bedaquiline is an important medicine for tuberculosis treatment. WHO API prequalification involves assessment of the API master file as well as verification of manufacturing-site compliance with WHO GMP requirements. For Indian API manufacturers, this reinforces the commercial importance of obtaining WHO-prequalified API status, particularly for supplying manufacturers producing medicines for international procurement programmes.

China – NMPA

- China Medical System also reported NMPA approval of ruxolitinib phosphate cream (Lumirix) for mild-to-moderate atopic dermatitis. The broader market development is significant: multinational pharmaceutical companies are increasingly licensing innovative assets originating in China rather than relying only on Western discovery pipelines.

South Korea – MFDS

- South Korea approved Recoflavone, jointly developed by GL PharmTech and Aju Pharm, as the country's 44th homegrown new drug. The product is intended for treatment of dry-eye disease. The approval is significant because it demonstrates South Korea's continuing transition from a primarily manufacturing-oriented pharmaceutical market towards development of domestically discovered and developed innovative medicines.

Brazil – ANVISA

Brazil's ANVISA approved several important products during the period.

- **Aquipta – atogepant** ANVISA approved Aquipta (atogepant) for prevention of migraine in adults experiencing at least four migraine episodes per month.
- **Etcamah – camizestrant** ANVISA approved Etcamah (camizestrant) on 21 September for ER-positive/HER2-negative advanced or metastatic breast cancer associated with ESR1 mutation. This is another example of precision oncology based on molecular biomarkers.
- **Arpraziquantel** - On 30 September, ANVISA approved Farmanguinhos Arpraziquantel for treatment of schistosomiasis in children aged 3 months to 6 years. This is particularly relevant to global health because schistosomiasis remains an important neglected tropical disease affecting populations across Africa, Asia, Latin America and other tropical regions.

Saudi Arabia – SFDA

- Saudi Arabia made a significant regulatory breakthrough during September. The Saudi Food and Drug Authority became the first regulatory authority globally to approve Frehemgo (denecimig) for routine prophylaxis of bleeding episodes in patients with haemophilia A, with or without factor VIII inhibitors. Frehemgo had previously been designated under the SFDA's Breakthrough Medicines Program. The development illustrates the increasing importance of Saudi Arabia as an early-access regulatory market, particularly for innovative and specialised medicines.

UAE – Emirates Drug Establishment

- The UAE also recorded an important first/early approval. The Emirates Drug Establishment announced on 30 September that the UAE had become the second country globally to approve MIMRYLO (rusfertide) for adults with polycythaemia vera. The UAE is simultaneously positioning itself as a regional pharmaceutical and biotechnology hub.

Major Global Investments, Licensing Deals and Joint Ventures

- **Novartis – Abogen: up to US\$7.8 billion** - One of the most significant transactions of the period was the agreement between Novartis and China's Abogen. Novartis will pay approximately US\$575 million upfront, with the overall transaction potentially reaching US\$7.8 billion. The agreement covers an experimental autoimmune drug, ABO2203, based on mRNA technology, with the potential for additional programmes. This is a major indication of Western Big Pharma increasingly sourcing innovative technologies from Chinese biotechnology companies.
- **Sanofi – Regeneron: up to US\$8 billion** - Sanofi and Regeneron expanded their partnership through an agreement worth up to US\$8 billion. Sanofi will pay US\$1 billion upfront, with up to US\$7 billion in potential milestones. The companies will develop four antibody drugs targeting type-2 inflammation pathways. Regeneron will lead research while Sanofi will manage global commercialisation if the drugs are approved.
- **AstraZeneca – Summit Therapeutics: US\$2 billion** - AstraZeneca announced a US\$2 billion investment in Summit Therapeutics to accelerate development of ivonescimab, a PD-1/VEGF bispecific antibody, in combination with ADCs. Ivonescimab is already approved in China for certain NSCLC indications. The transaction demonstrates the growing importance of bispecific antibodies and ADC combinations in oncology.

GLOBAL PHARM MARKET INTELLIGENCE

- **Novo Nordisk – Hengrui: up to US\$2.6 billion** - Novo Nordisk entered into a deal potentially worth US\$2.6 billion with China's Hengrui for a preclinical GLP-1/GIP drug. This reinforces the intense global competition in obesity and metabolic disease therapies.
- **Novo Nordisk – Nanexa: up to US\$1.3 billion** - Novo also entered into a deal potentially worth approximately US\$1.3 billion involving Nanexa's long-acting injectable drug-delivery platform. The agreement is focused on long-acting formulations of obesity and type-2 diabetes medicines.
- **Telix – ITM: approximately US\$1.65 billion** - Telix agreed to acquire ITM in a transaction worth approximately US\$1.65 billion. The deal combines radiopharmaceutical pipelines and manufacturing capabilities. The transaction highlights the rapid development of the radiopharmaceutical and targeted-radiation therapy market.
- **Lilly – InnoCare: up to US\$3.35 billion** - Eli Lilly entered into a five-target drug-discovery collaboration with China's InnoCare. The transaction includes approximately US\$100 million in upfront and near-term payments, with up to US\$3.25 billion in milestones.
- **Genentech – Earendil Labs: up to US\$1.5 billion** - Genentech agreed to a multi-target bispecific antibody collaboration with Earendil Labs, involving approximately US\$55 million upfront and potential payments of up to US\$1.5 billion.
- **Boehringer Ingelheim – Envisagenics: up to US\$1 billion** - Boehringer Ingelheim entered into a multi-year oncology collaboration with Envisagenics, with potential value of approximately US\$1 billion.
- **Samsung Biologics – European pharma company** - Samsung Biologics announced a US\$262 million biologics manufacturing contract with an unnamed European pharmaceutical company. The agreement extends to 2033 and takes Samsung Biologics' cumulative contracted business above US\$21 billion. This is particularly relevant to Indian CDMOs because it demonstrates the continuing demand for long-term outsourced biologics manufacturing. Hengrui and Novo–Nanexa transactions reinforce this trend.

Trade Analysis for April–August 2026

India's bulk drug and drug-intermediate trade recorded a positive overall trend during April–August 2026. Imports declined by 3.5% year-on-year, while exports increased by 8.9%. The improvement in exports, combined with lower imports, resulted in a substantially higher export surplus for the sector during the period

Overall Import-Export Performance:

Values in US\$ mn

Particulars	April-Aug 2025	April-Aug 2026	Change
Imports	1877.18	1811.33	-3.51%
Exports	1936.13	2109.21	+8.94%
Trade Surplus	58.96	297.88	

Import Trends:

China continued to be India's dominant source of bulk drugs and drug intermediates. Imports from China declined by 6.5%, 1,364.76 to US\$1,276.34 . Despite this reduction, China still represented approximately 70.5% of total imports in April–August 2026. Other important sources included Italy, Singapore, Spain, the United States and Japan. Imports from several of these countries increased during the period, suggesting changes in sourcing patterns across individual product categories.

Major sources of bulk drug imports

Values in US\$ mn

Country	Imports	Year-on-year Change
China	1,276.34	-6.5%
Italy	67.99	+40.1%
Singapore	49.81	+27.3%
Spain	45.22	+29.3%
United States	37.33	+24.0%
Japan	35.54	+35.2%
Germany	32.96	-43.7%

The reduction in imports from China is a positive movement, but it does not by itself establish that domestic production has replaced the imports. Changes may also reflect prices, demand, inventory movements and sourcing from other countries.

Major product categories contributing to imports

The HS-code-wise data show significant movements across product categories: (Values in US\$ mn)

- **Other heterocyclic compounds:** Imports increased by 32.2%, from 269.28 to 356.02, making this one of the largest reported import categories.
- **Other antibiotics:** Imports declined by 11.9%, from 325.40 to 286.68 million.
- **Methionine:** Imports rose by 67.7%, 68.36 to 114.66
- **6-APA:** Imports fell sharply by 57.6%, from 154.66 to 65.58
- **Erythromycin and its derivatives:** Imports declined by 6.5%, from 79.97 to 74.77

The steep decline in 6-APA imports merits particular attention because of its relevance to the penicillin and amoxicillin value chain. the decline resulted may be due to increased domestic production, lower demand, inventory changes or other factors. These movements provide a useful basis for identifying products that warrant closer examination for domestic manufacturing potential, subject to assessment of technology, economics, scale and market demand.

Export Performance

India's bulk drug exports increased by 8.9% to 2,109.21 during April–August 2026. The United States remained the largest identified export destination, with shipments rising by 11.7% to 245.25. Brazil recorded particularly strong growth, with exports increasing by 46.6% to 137.37 . Exports to the Netherlands, Germany, Bangladesh and Turkey also registered healthy increases. In contrast, exports to China declined by 14.7%.

Major export destinations

Values in US\$ mn

Country	April-Aug 2026	Year-on-year change
United States	245.25	+11.7%
Brazil	137.37	+46.6%
Netherlands	84.74	+26.9%
Germany	76.34	+30.4%
Bangladesh	73.31	+14.3%
Turkey	70.16	+36.5%
China	63.46	-14.7%
Egypt	60.34	+12.0%
Japan	50.28	+2.0%

The growth across several established pharmaceutical markets is encouraging. The increase in exports to Brazil, Turkey, Germany and the Netherlands points to opportunities for Indian manufacturers to strengthen their international market presence.

Major Exported Product Categories

The HS-code-wise export data indicate growth in several important product categories.

Product category	Values in US\$ mn	
	Apr–Aug 2026	Year-on-year change
Other heterocyclic compounds	334.11	+9.9%
Other antibiotics	227.65	+35.0%
Amoxicillin and its salts	61.46	-3.4%
Steroidal hormones and related products	55.27	+22.0%
Paracetamol	47.79	+40.8%
Caffeine and its salts	45.11	+59.3%
Niacin and niacinamide category	44.88	+37.6%
Erythromycin and its derivatives	38.94	-1.7%

Exports of other antibiotics increased by nearly 35%, while paracetamol and caffeine recorded substantial growth. These trends indicate improving export performance in several established product segments.

At the same time, exports of amoxicillin and its salts declined by 3.4%, despite the strong reduction in reported 6-APA imports. This contrast reinforces the need to examine individual products and the entire manufacturing value chain rather than interpreting changes in one intermediate as a direct indicator of finished API production or export performance.

ASSOCIATION ACTIVITIES

Important Circulars sent during the month

Sl. No.	Date	Subject
1	22-09-2026	Certificate Course on Applied Life Cycle Assessment (LCA) — complimentary participation passes for BDMAI MSME members
2	28-09-2026	Presentations made during the Annual General Meeting of BDMAI
3	08-10-2026	Online Knowledge-Sharing Session on “Safety Cultural Transformation” — 9 October 2026
4	09-10-2026	Conference on “Advancing Implementation of Green & Sustainable Chemistry in the Pharma Supply Chain” — 28–29 October 2026; special rates for BDMAI members

Please click [HERE](#) to see the above circulars in detail

Important Notifications and circulars

Sl. No.	Dept.	Date	Notification / circular	Relevance to bulk drug manufacturers
1	DGFT	30 Sep 2026	Notification No. 40/2026-27 — extension of MIP of ₹1,774/kg on Sulfadiazine API imports up to 30 November 2026	Directly relevant to manufacturers importing or competing with imported Sulfadiazine API.
2	DGFT	30 Sep 2026	Notification No. 41/2026-27 — extension of the RoDTEP scheme up to 31 December 2026 for DTA, Advance Authorisation, SEZ and EOU exports	Potentially relevant to API exporters, subject to the product's eligibility, applicable rate and scheme conditions.
3	DGFT	30 Sep 2026	Notification No. 39/2026-27 — extension of MIP of US\$111/kg on specified chemical imports up to 30 November 2026	Relevant only if the specified chemical products are used or traded by a member company. It should not be assumed to cover all pharmaceutical intermediates.
4	CBIC / Customs — National Assessment Centre, Chemicals	28 Sep 2026	Public Notice No. 118/2026 — documentation requirements for import of specified product categories under NAC-Chemicals	Relevant to importers of chemicals, including API manufacturers where their imported materials fall within the specified categories.
5	CDSO	22 Sep 2026	Circular on indiscriminate use of NSAID painkillers, antibiotics and associated risk of chronic kidney disease	Primarily a public-health and drug-use advisory, rather than a new API manufacturing requirement. Relevant to companies supplying affected drugs and formulation manufacturers.
6	DGFT	15 Sep 2026	Notification No. 36/2026-27 — de minimis exemption from Registration-cum-Membership Certificate (RCMC) requirements for low-value exports, up to ₹3 lakh	May help smaller exporters, subject to the conditions and scope of the exemption.

ASSOCIATION ACTIVITIES

BDMAI Celebrates its 35th Annual General Meeting on 26th September 2026. Dr. Rajeev Singh Raghuvanshi, Drug Control General of India and Shri R Chandrasekhar, Joint Drug Controller of India have participated in the event as Chief Guest and Guest of Honour respectively. IICT made a presentation on 'Industry Connect – Capabilities, Technologies, Opportunities for Collaboration, Innovation'. Over 180 delegates representing our member companies actively participated in the event.



Can Next-Gen Geothermal Eliminate Off-Peak Scope 2 Emissions Where Solar & Wind Fail?

Source: www.wudbox.in

For decades, the search for clean energy has faced a persistent catch-22. Solar panels generate abundant, inexpensive electricity, but only when the sun shines. Wind turbines produce vast amounts of power, but only when the breeze blows. While lithium-ion batteries and grid-scale storage help bridge these gaps, powering heavy industry, grid baseloads, and data centers around the clock requires energy that is both continuous and carbon-free. Nuclear energy and traditional hydroelectric dams offer steady, round-the-clock power, but they come with high upfront costs, lengthy regulatory delays, or strict geographic limitations. This has led scientists, engineers, and energy leaders to look directly beneath our feet. Beneath the Earth's surface lies a virtually inexhaustible reservoir of heat—a natural thermal engine that has been running for billions of years. Traditional geothermal energy, however, was historically restricted to rare geographic "hotspots" where underground steam or hot water naturally bubbled close to the surface, such as in Iceland, New Zealand, or parts of California. That constraint is disappearing. A new wave of technologies—collectively known as Next-Generation Geothermal—is transforming geothermal from a niche geographic resource into a scalable, ubiquitous, 24/7 clean energy powerhouse.

The Core Limitation of Conventional Geothermal

To understand why next-generation geothermal is such a breakthrough, it helps to understand how traditional geothermal power works. Conventional geothermal relies on three key ingredients existing simultaneously:

- Heat: Hot rocks located deep underground.
- Fluid: Water trapped in underground natural reservoirs.
- Permeability: Natural cracks and channels in the rock that allow the water to flow, absorb heat, and rise to the surface as steam or high-temperature water.

When all three align naturally, you get an ideal geothermal site. Engineers drill a well into the underground fluid reservoir, bring the steam to the surface to spin a turbine, convert that mechanical energy into electricity, and re-inject the cooled water back into the ground to repeat the cycle. The problem is that these three conditions do not naturally occur together everywhere. In many locations, hot rock exists deep underground, but sufficient natural fluid or permeability is absent, limiting the development of conventional geothermal resources.

The Breakthroughs:

How Next-Gen Geothermal Works Next-generation geothermal seeks to overcome some of the geographic limitations of conventional geothermal by using advanced drilling, subsurface characterisation, reservoir engineering, and closed-loop fluid systems. Rather than relying entirely on naturally occurring geothermal reservoirs, these approaches can expand

development into a wider range of geological settings, subject to suitable underground temperatures, geology, drilling conditions, and project economics. Two major next-generation approaches are Enhanced Geothermal Systems (EGS) and closed-loop geothermal. EGS has progressed further toward utility-scale electricity generation, while closed-loop systems aim to avoid hydraulic stimulation and reduce dependence on naturally permeable reservoirs.

A. Enhanced Geothermal Systems (EGS) EGS creates artificial permeability where none previously existed.

Engineers drill several kilometres into hot rock, using advanced directional and horizontal drilling techniques adapted in part from the oil and gas sector.

They inject fluid under carefully controlled pressure to create or reopen fractures in the rock, establishing a permeable heat-exchange reservoir.

A second well is drilled into this newly created network. Water is pumped down the injection well, passes through the hot fractured rock, absorbs thermal energy, and ascends through the production well to power a surface generator. By engineering permeability within hot rock, EGS can potentially enable geothermal development in regions that lack the natural reservoirs required by conventional geothermal systems

B. Advanced Geothermal Systems (AGS) / Closed-Loop Radiators

While EGS opens micro-cracks in rock, Closed-Loop Systems keep the working fluid entirely contained inside sealed pipe networks underground.

Think of an AGS system as a massive subterranean radiator:

- Deep wells are drilled and connected horizontally deep inside hot rock formations.
- A working fluid (such as supercritical carbon dioxide or specialized organic fluids) is circulated down into the loop, heated by the surrounding rock through conductive heat transfer, and returned to the surface. Because the system is completely closed:

Fluid does not interact directly with natural groundwater, eliminating contamination risks. No working fluid is lost to surrounding subterranean rock formations. Operations run continuously without requiring complex underground pressure or fluid balance management.

Why Next-Gen Geothermal Is a Game-Changer

Next-generation geothermal offers a combination of characteristics that few other energy sources can match:

Characteristic	Solar& Wind	Battery Storage	Nuclear	Next-Gen Geothermal
Availability	Weather Dependent	Hours-limited	24/7 Base load	24/7 Baseload
Land Footprint	Large	Small to Medium	Small	Extremely small
Fuel Costs	Zero	Zero	Moderate	Zero
Geographic Flexibility	Regional	Flexible	Regulatory Dependent	High (Everywhere at depth)

Continuous, Weather-Independent Baseload

Unlike solar panels that stop generating at dusk or wind turbines that go idle during calm weather, geothermal energy delivers a steady output 365 days a year. It provides true **baseload power**—the constant minimum level of electricity required by power grids, industrial plants, and data centers around the clock.

Minimal Land Footprint

Solar fields and wind farms require vast acreage to generate hundreds of megawatts. Geothermal plants extract their energy vertically. A commercial next-gen geothermal facility requires a compact surface footprint—often just a few acres for wellpads and power generation equipment—making it ideal for industrial integration or urban edge deployment.

Thermal Energy Storage & Flexible Load Following

Beyond providing constant power, next-gen geothermal plants can double as giant underground thermal storage units. By controlling fluid circulation rates or holding fluid underground under pressure, plant managers can ramp output up or down to match grid demand.

Real-World Deployments: Where Next-Gen Geothermal Is Already Operating

Next-generation geothermal is no longer limited to computer simulations or laboratory trials. Across North America and Europe, commercial facilities and dedicated field research sites are proving that deep Earth heat can power modern grids, corporate infrastructure, and municipal heating systems.

Fervo Energy: Project Red (Nevada, USA)

- **Technology Used:** Enhanced Geothermal System (EGS) with horizontal drilling.
- **Operational Scope:** Located in northern Nevada, Fervo Energy completed a 30-day well test at its **Project Red** site, drilling to vertical depths exceeding 7,000 feet and extending horizontally over 3,000 feet into hot granite rock. The facility generated 3.5 Megawatts (MW) of continuous power, setting an output benchmark for commercial EGS systems.
- **Commercial Impact:** Project Red served as Fervo's commercial pilot and demonstrated sustained EGS power production. Fervo's subsequent Cape Station development has secured major corporate offtake agreements, including a 396 MW PPA with Google announced in September 2026.

Fervo Energy: Cape Station (Utah, USA)

- **Technology Used:** Multi-well commercial-scale Enhanced Geothermal Systems (EGS).
- **Operational Scope:** Cape Station is being developed in Beaver County, Utah, with 500 MW of capacity under construction across its planned phases. Phase I, comprising approximately 100 MW, is currently

Fervo Energy: Cape Station (Utah, USA)

- undergoing commissioning, with first test power expected in Q4 2026 and full production anticipated by year-end.
- **Commercial Impact:** Fervo has signed offtake agreements with major energy buyers, including a 396 MW PPA with Google announced in September 2026. The agreement relates to power from Cape Station and is expected to support Google's future data-centre operations in Utah.

Eavor Technologies: Geretsried Project (Bavaria, Germany)

- **Technology Used:** Advanced Geothermal System (AGS) / Closed-Loop Architecture (Eavor-Loop™).
- **Operational Scope:** Located south of Munich, this site is the world's first commercial-scale deep closed-loop geothermal facility. Engineers drilled dual vertical wells to depths of approximately 4,500 meters, connecting horizontal laterals underground to form a closed radiator loop without hydraulic fracturing or extracting groundwater.
- **Commercial Impact:** The facility delivers **8.2 MW of electricity** to the German electrical grid alongside **64 MW of thermal energy** for municipal district heating in Geretsried.

U.S. DOE FORGE Facility (Milford, Utah, USA)

- **Technology Used:** Dedicated Frontier Observatory for Research in Geothermal Energy.

- **Operational Scope:** Funded by the U.S. Department of Energy, **FORGE** is a underground field laboratory designed to test and optimize EGS technologies. It features angled wells drilled into hot granite at temperatures exceeding 200°C, serving as a testbed for drill bits, seismic sensors, and stimulation tools.
- **Commercial Impact:** Provides open-source operational data and engineering protocols that commercial developers use to de-risk geothermal project execution.

Key Engineering Challenges to Overcome

While commercial deployments prove that next-generation geothermal works, scaling the technology globally requires addressing key engineering and economic hurdles:

- **High Upfront Drilling Costs:** Drilling multiple kilometers into hard granite or basalt rock remains capital-intensive. Drill bits wear out rapidly under high heat and pressure. Lowering capital expenditure requires faster drilling technologies, such as contactless thermal drilling, plasma jets, or high-energy millimeter-wave beams.
- **Managing Induced Seismicity:** Creating underground fracture networks requires precise fluid pressure management. If injected fluid contacts an active geological fault, it can induce minor seismic activity. EGS operators manage this risk through real-time micro-seismic monitoring, AI-guided precision drilling, and low-pressure stimulation.

Thermal Depletion Management: Extracting heat faster than the Earth's natural conductive flow replenishes it can cause subterranean rock temperatures to drop over time. Engineering expansive, well-distributed underground surface areas prevents localized cooling and preserves plant operational life for decades.

The Path Ahead: Clean, Firm Power for the Global Transition

Next-generation geothermal is moving from experimental technology toward early commercial deployment—but its ultimate scalability depends on drilling costs, subsurface performance, induced-seismicity management and long-term economics. A resilient, low-carbon power system will require firm sources of electricity that can complement variable renewables and support energy-intensive demand regardless of weather or time of day.

By integrating advanced drilling, subsurface characterisation, reservoir engineering and closed-loop fluid systems, next-generation geothermal approaches aim to make deep Earth heat accessible in a wider range of geological settings. Real-world projects are now demonstrating the potential of these technologies for electricity generation and district heating, while commercial-scale developments are beginning to test their ability to operate economically at larger scale. If the remaining technical and economic challenges can be overcome, next-generation geothermal could become an important source of firm, low-carbon energy in the global clean energy transition.

EVENTS WHERE BDMAI WILL BE PARTICIPATING

The banner features a dark green background with a faint image of a modern building at night. On the left, the CPHI logo is displayed with the text 'by Informa' below it. In the center, the PMEC logo is shown with 'by Informa' below it. To the right, the text 'BDMAI@' is at the top, followed by 'Stall No.2127,' and 'API Zone, Hall 2' in large white letters. Below 'API Zone, Hall 2' is the word 'YASHOBHOOMI' in white. At the bottom left, 'INDIA 23-25 NOV 2026' and 'IICC, Yashobhoomi, New Delhi' are listed. In the center bottom, 'INDIA 24-26 NOV 2026' and 'IEML, Greater Noida, Delhi NCR' are listed.

CPHI
by Informa

PMEC
by Informa

BDMAI@
Stall No.2127,
API Zone, Hall 2
YASHOBHOOMI

INDIA
23-25 NOV 2026
IICC, Yashobhoomi,
New Delhi

INDIA
24-26 NOV 2026
IEML, Greater Noida,
Delhi NCR

The banner has a red background with a white box at the top left containing the GCS logo and 'GLOBAL ChemShow International Exhibition 2026'. To the right, 'Hall no: 4' and 'Bombay Exhibition Centre, Mumbai, India' are written. Below the white box, '14-15 December 2026' and 'Booth Bookings now open - Secure your Premium Space today' are displayed. An image of two glowing orange crystals is on the right. Below that, a list of exhibitors and visitors is shown. A white box at the bottom center lists the types of products and services. At the bottom, logos for the media partner (Global Inquiry Magazine), organizer (Needs Information Services Ltd.), and supporting association (BDMAI) are shown, followed by contact information.

GCS GLOBAL ChemShow
International Exhibition 2026

Hall no: 4
Bombay Exhibition Centre,
Mumbai, India

14-15 December 2026
Booth Bookings
now open -
Secure your Premium
Space today

300+ Exhibitors | 22,000+ Trade Visitors | International Attendees

**Bulk, Fine & Speciality Chemicals, API's, Pharma Intermediates,
Pharma Raw Materials, Pharma Excipients, Pharma Formulations,
Custom Synthesis & Research, Contract Manufacturing,
Process Technology Expo**

Media Partner
GLOBAL
INQUIRY MAGAZINE

Organised by
NS Needs
Information
Services Ltd.

Supporting
Association

BDMAI
BULK DRUG
MANUFACTURERS
ASSOCIATION
INDIA

Contact : Ms. Roja Rani : +91-92461 83424 | www.globalchemshow.com